Appendix C
Frac-Out Contingency Plan for Horizontal Directional Drill:

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The natural gas pipeline extension to the Cosumnes Power Plant (CPP) is proposed to cross the Cosumnes River, Badger Creek, and Laguna Creek by Horizontal Directional Drilling (HDD). HDD is less intrusive than traditional open-cut trenching where habitats sustain direct soil disturbance.

Frac-out, or inadvertent return of drilling lubricant, is a potential concern when the HDD is used under sensitive habitats, waterways, and areas of concern for cultural resources. The HDD procedure uses bentonite slurry, a fine clay material as a drilling lubricant. The bentonite is non-toxic and commonly used in farming practices, but benthic invertebrates, aquatic plants and fish and their eggs can be smothered by the fine particles if bentonite were discharged to waterways.

The purpose of a Contingency Plan or "Frac-out" plan is to:

- Minimize the potential for a frac-out associated with horizontal directional drilling activities
- Provide for the timely detection of frac-outs
- Protect areas that are considered environmentally sensitive (streams, wetlands, other biological resources, cultural resources)
- Ensure an organized, timely, and "minimum-impact" response in the event a frac-out and release of drilling mud occur
- Ensure that all appropriate notifications are made to the CEC and environmental specialists immediately (e.g., Designated Biologist, CRS), and to appropriate regulatory agencies in 24 hours and that documentation is completed

The "Frac-out" plan is prepared by the drilling contractor, to ensure that preventive and responsive measures can be implemented by the contractor. To minimize the potential for a frac-out, the Contingency Plan includes:

- Design protocols to be implemented for the protection of sensitive cultural and biological resources
- Design protocols to require a geotechnical engineer or qualified geologist to make recommendations regarding the suitability of the formations to be bored to minimize the potential for frac-out conditions

Prior to construction, sensitive cultural and biological resources will be protected by implementing the following measures:

- A pedestrian survey will be conducted of the drilling entry and exit areas, surrounding work areas, and the drilling route (to the extent it is accessible) to ensure that there are no cultural resources present on the surface.

- Excavation of all entry or exit points will receive full-time cultural monitoring. If cultural resources are discovered during pit excavation or as the result of a frac-out, the applicable cultural resource conditions of certification will be followed.
- Where present, sensitive cultural and biological resources will be flagged for avoidance or construction limits will be clearly marked
- Barriers (straw bales or sedimentation fences) will be erected between the bore site and nearby sensitive resources prior to drilling, as appropriate, to prevent released material from reaching the resource
- On-site briefings will be conducted for the workers to identify and locate sensitive resources at the site
- Ensure that all field personnel understand their responsibility for timely reporting of frac-outs
- Maintaining necessary response equipment on-site or at a readily accessible location and in good working order
- Disallowing fill into waters of the United States unless proper permits have been obtained
- Monitoring for the duration of drilling activities by a qualified biologist
- Implement any of the mitigation measures specified by CDFG in its Streambed Alteration Agreement, pursuant to Fish and game Code Section 1603.

To further reduce the potential impacts of a frac-out, construction of the pipeline is expected to occur when there is least (or no) flow in the Cosumnes, Badger and Laguna Creeks. Construction is expected to begin in summer of 2003 and end in the fall of 2003. The drilling entry and exit areas will be clearly marked, surrounded by construction fencing and silt fencing to minimize the potential for all-site migration of drilling mud. Access and egress locations will be designated and clearly marked.

The primary areas of concern for inadvertent returns occur at the entrance and exit points where the drilling equipment are at depths of less than 12 to 20 feet deep. The likelihood of inadvertent return decreases as the depth of the pipe increases. To reduce the potential of a frac-out affecting sensitive resources, the entrance and exit points for drilling will be located at least 150 feet from riparian vegetation along the Cosumnes, Badger and Laguna Creeks.

To minimize the potential extent of impacts from a frac-out, all HDD will be attended by a full-time biological monitor, to look for observable “frac-out” conditions or lowered pressure readings on the drilling equipment. Early detection is key to minimizing the area of potential impact.

Contingency Response

Once a frac-out is identified:

- All work stops, including the recycling of drilling mud/lubricant. The pressure of water above the pipe keeps excess mud from escaping through the fracture.
- Determine the location and extent of the frac-out.
- A cultural resources monitor shall monitor all activities. The CRS shall provide notification in accordance with CUL-6 for any discovery of cultural materials in association with the frac-out, frac-out clean-up, post-construction maintenance, and restoration.

If the frac-out is terrestrial:

- Isolate the area with hay bales, sand bags, or silt fencing to surround and contain the drilling mud.
- Consult with CDFG and property owner representative (i.e., Nature Conservancy) regarding next appropriate action among the following:
    - A mobile vacuum truck will be used to pump the drilling mud from the contained area and recycled to the return pit.
    - The drilling mud will be left in place to avoid potential damage from vehicles entering the area.
- Once excess drilling mud is removed, the area will be seeded and/or replanted using species similar to those in the adjacent area, or allowed to re-grow from existing vegetation.
- Revegetated areas will be monitored twice per year for two years subsequent to frac-out to confirm revegetation is successful.

If the frac-out is aquatic (i.e., under water):

- Monitor frac-out for 4 hours to determine if the drilling mud congeals. (Bentonite will usually harden, effectively sealing the frac-out location).
- Consult with CDFG and property owner representative (i.e., Nature Conservancy) regarding next appropriate action among the following:
    - If drilling mud congeals, take no other action that would potentially suspend sediments in the water column.
    - If drilling mud does not congeal, erect isolation/containment environment (underwater boom and curtain).
    - If the fracture becomes excessively large, a spill response team would be called in to contain and clean up excess drilling mud in the water. Phone numbers of spill response teams in the area will be on site.
- If the spill affects and area that is vegetated, the area will be seeded and/or replanted using species similar to those in the adjacent area, or allowed to re-grow from existing vegetation.
- Revegetated areas will be monitored twice per year for two years subsequent to frac-out to confirm revegetation is successful.

After frac-out is stabilized and any required removal is completed, document post-cleanup conditions with photographs and prepare frac-out incident report describing time, place, actions taken to remediate frac-out and measures implemented to prevent recurrence. Incident report will be provided to CEC and CDFG as part of project compliance not more than 30 days after the incident.